Amendments to the Claims:

1. (Currently Amended) A system for visualizing a three-dimensional (hereinafter "3D") volume of a patient, the system including:

an input which receives a three-dimensional set of medical image data representing voxel values of the 3D volume;

a storage which stores the medical image data set;

an output which provides pixel values of a two-dimensional (hereinafter "2D") image representation for rendering; and

a processor which, under control of a computer program, processes the medical image data set to obtain the 2D image representation by performing the steps of:

casting a ray from each pixel of the 2D image representation through the volume;

traversing along each ray through at least a plurality of ray positions within the volume; [[:]]

selecting one of a plurality of rendering algorithms and/or rendering parameters, in dependence on the ray position, the selected one of the plurality of rendering algorithms and/or rendering parameters changing with the ray position;

for each of the plurality of ray positions, calculating a contribution to a corresponding pixel value based on at least one voxel value within a predetermined range of the ray position using the selected one of the rendering algorithms and/or rendering parameters for each of the ray positions.

2. (Previously Presented) The system as claimed in claim 1, wherein the selecting of one of the plurality of rendering algorithms and/or rendering parameters is based on a-priori knowledge of at least one of the following: the volume, the medical situation, the clinical situation based on at least one of anatomical, medical and clinical knowledge of a medical expert.

3. (Previously Presented) The system as claimed in claim 1, further including a 3D model of at least one object in the volume, the used one of the plurality of rendering algorithms and/or rendering parameters being selected in accordance with a relationship between each ray position and the at least one object of the 3D model.

4. (Previously Presented) The system as claimed in claim 1, wherein the the rendering algorithm and/or rendering parameters is rule-based, such that based on a rule, a processing action is selected based on the ray position, the processing action being selected among:

stepping direction along the ray,

changing a step size over a portion of the ray,

changing a 3D direction of the ray starting at a selected ray position.

5. (Previously Presented) The system as claimed in claim 4, wherein a rule prescribes that, for each of the plurality of ray positions, at least one processing action changes in dependence on processing results of ray positions along the ray that have already been processed.

6. (Previously Presented) A system for visualizing a three-dimensional (hereinafter "3D") volume, in particular for medical applications; the system including:

an input for receiving a three-dimensional set of data representing voxel values of the 3D image;

a storage for storing the data set;

an output for providing pixel values of a two-dimensional (hereinafter "2D") image for rendering; and

a processor for, under control of a computer program, processing the data set to obtain a 2-dimensional representation of the volume by projecting the volume onto an imaginary 2D projection screen from a predetermined viewpoint by for each pixel of the 2D projection image:

casting a ray from the viewpoint through the pixel and through the volume;

traversing along the ray through at least a plurality of ray positions within the volume under control of a protocol that determines a rendering algorithm and/or rendering parameters in dependence on the ray position; and

for each of the plurality of ray positions using the determined rendering algorithm/parameters to calculate a contribution to a pixel value of the pixel based on at least one voxel value with a predetermined range of ray positions,

wherein the protocol is rule-based;

wherein a rule prescribes for each of the plurality of ray positions at least one processing action at least in dependence on processing results of ray position along the ray that already been processed wherein the processing action includes at least one of the following:

jumping forward or backward along a ray to a particular ray position, and resuming processing from that position;

switching a stepping direction along a ray between forward and backward as seen from the viewpoint;

changing a step size that determines a next ray position with respect to a current ray position in the stepping direction;

changing a 3-dimensional direction of a ray starting from a particular position;

switching to another rendering algorithm;

adapting rendering parameters for controlling the rendering algorithm;

switching to another feature detection method, which determines the type of information that is going to be visualized by the rendering algorithm.

7. (Previously Presented) The system as claimed in claim 1, further including:

a storage which stores a plurality of protocols for controlling the traversing along the ray.

8. (Previously Presented) The system as claimed in claim 7, wherein the storage includes a plurality of predetermined protocols which control the selection of the rendering algorithm and/or rendering parameters, each of the protocols corresponding to one of a plurality of anatomical regions of the patient.

9. (Previously Presented) The system as claimed in claim 7, wherein the storage stores protocols for switching among feature detection methods to alter a type of information visualization.

10. (Cancelled)

11. (Currently Amended) The system as claimed in ~~claim 10~~ claim 1, wherein the computer program is operative to cause the processor to:

enable a human operator to select at least one protocol from the plurality of stored protocols for processing the volume; and

store a selection of the human operator in association with an identity of the operator for subsequent retrieval.

12. (Previously Presented) A system as claimed in claim 1, wherein the computer program is operative to cause the processor to change the rendering parameters and/or rendering algorithm along the ray such that the corresponding pixel value is calculated using a plurality of rendering algorithms and/or rendering parameters.

13. (Currently Amended) A tangible computer readable storage medium ~~carrying~~ storing a computer program for controlling a processor to process a three-dimensional set of medical data representing voxel values of a 3D volume depicting an anatomical region of a patient to obtain a 2D image having a plurality of pixels of the 3D volume by projecting the 3D volume onto an imaginary 2D projection screen by controlling the processor to perform the steps of:

from a memory which stores a plurality of rendering algorithms/parameters, selecting a subset of the rendering algorithm/parameters in accordance with an anatomical region depicted by the 3D volume;

casting a ray through each pixel of the 2D image and into the 3D volume;

stepping along the ray through a plurality of ray positions within the volume under control of a protocol that selects one of the subset of rendering algorithms/parameters to be implemented in dependence on the ray position; and

for each of the plurality of ray positions using the selected rendering algorithm/parameter to calculate a contribution to a pixel value of the pixel corresponding to the ray based on at least one voxel value within a predetermined range of the ray position,

wherein a plurality of different rendering algorithms/parameters are used to generate the pixel values of the 2D image from the voxels of the 3D volume.

14. (Currently Amended) A method of visualizing a 3D volume representing an anatomical region of a patient, which 3D volume is defined by a three-dimensional set of data representing voxel values of a 3D array of voxels of the 3D volume, as a 2D image defined by pixel values of a 2D array of pixels of a 2D image on an imaginary 2D projection screen, the method comprising:

with one or more processors:

casting a ray from each pixel into the 3D volume;

stepping along the ray to each of a plurality of ray positions within the volume under control of a protocol that selects one of a plurality of rendering algorithms/parameters in dependence on (1) the ray position and (2) the anatomical region of the patient represented by the ray position and (3) a medical or clinical situation;

for each of the plurality of ray positions using the selected one of the plurality of rendering algorithms/parameters to calculate the contribution to the pixel value of the pixel of the 2D image that corresponds to the ray; and

at least one of displaying the 2D image on a display monitor and storing the 2D image in a computer memory.

15. (Previously Presented) The method as claimed in claim 14, wherein the selected rendering algorithm/parameter at at least one of the ray position changes to a different rendering algorithm/parameter that jumps forward or backward along the ray to a particular ray position, and resumes processing from that ray position.

16. (Previously Presented) The method as claimed in claim 14, wherein the selected rendering algorithm/parameter at at least one of the ray position changes to a different rendering algorithm/parameter that at least one of switches a stepping direction along the ray and changes a step size that determines a next ray position with respect to a current ray position in the stepping direction.

17. (Previously Presented) The method as claimed in claim 14, wherein the selected rendering algorithm/parameter at at least one of the ray position changes to a different rendering algorithm/parameter that changes a 3-dimensional direction of a ray starting from a current ray position.

18. (Previously Presented) The method as claimed in claim 14, wherein the selected rendering algorithm/parameter at at least one of the ray position changes to a different rendering algorithm/parameter that determines a type of anatomical information that is going to be visualized by the rendering algorithm in the 2D image.

19. (Previously Presented) The method as claimed in claim 14, further including:

referencing a 3D model that models typical anatomical structure in the anatomical region represented by the 3D volume; and

selecting the rendering algorithm/parameter based on the typical anatomical structure predicts at each ray position.

20. (Previously Presented) The method as claimed in claim 14, wherein selecting the rendering algorithm is based on processing results at prior ray positions along the ray.

21. (New) The method as claimed in claim 14, wherein the selected one of the plurality of rendering algorithms/parameters changes with the ray position.